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REMARKS

Claims 1-63 have been examined. Claims 1-12, 22-32, 33-45, 57-58, 61 and 63 have been rejected under 35 U.S.C. § 112, second paragraph. Claims 46, 51, 56 and 59 have been rejected under 35 U.S.C. § 102(b), and claims 13-21, 47-50, 52-55, 60 and 62 have been rejected under 35 U.S.C. § 103(a).

I. Preliminary Matters

Applicant has amended the specification to correct a translation error and has amended claims 9, 16, 57 and 58 to correct minor errors. Such amendments are not made in view of prior art, and do not narrow the scope of the claims.

II. Rejection under 35 U.S.C. § 112, second paragraph

The Examiner has rejected claims 1-12, 22-32, 33-45, 57-58, 61 and 63 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Regarding claims 1, 33, 57-58 and 63, the Examiner maintains that the claims disclose a method, but only recite structural limitations. Therefore, the Examiner is unsure if the claims are directed to a method or an apparatus.

Claims 2-12, 22-32, 36-45 and 61 are rejected due to their dependency on claim 1.
Claims 34-35 are rejected due to their dependency on claim 33.

As a preliminary matter, Applicant would like to note that in the October 21, 2002 Office Action, the Examiner rejected claim 1 in view of prior art, and indicated that claim 33 contained

allowable subject matter. Newly added claims 57-58 and 63 contain similar subject matter as claims 1 and 33. In addition, claim 58 clearly recites method limitations, such as detecting, storing, reading and judging. As stated in MPEP § 2173.06, where a claim is subject to more than one interpretation, an Examiner should make a rejection under 35 U.S.C. § 112, second paragraph, as well as a rejection over prior art based on the interpretation which renders the prior art applicable.

Accordingly, Applicant would like to point out to the Examiner that both the previous rejection of claim 1, and the indication of allowable subject matter in claim 33, demonstrates that the subject matter of claims 1, 33, 57-58 and 63 is clear enough to make a rejection in view of prior art. Therefore, Applicant respectfully requests that any future rejection of the claims is on a non-final basis.

Regarding the rejection under 35 U.S.C. § 112, second paragraph, Applicant submits that there is method language positively recited in the claims, i.e. “jetting” ink drops and “detected” using a piezo-electric device. Therefore, Applicant submits that the claims recite enough method limitations and do not need to be amended.

**II. Rejection under 35 U.S.C. § 102(b) over JP 10305590 to Kurihara et al.
 (“Kurihara”).**

Claims 46, 51, 56 and 59 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Kurihara.

A. Claim 46

Applicant submits that claim 46 is patentable over the cited reference. For example, claim 46 recites that the piezo-electric element of the piezo-electric device has a vibration part. The piezo-electric device outputs a signal indicating a residual oscillating state of the vibration part under free oscillation. An ink consumption condition is detected based on a change of the residual oscillating state of the vibration part under free oscillation corresponding to ink being consumed.

Applicant submits that Kurihara fails to teach or disclose an ink consumption state based on a residual oscillating state of a vibration part under free oscillation. Rather, Kurihara discloses an excited vibration produced by using amplifier 10 (para. [0015]; [0017]).

Accordingly, Applicant submits that claim 46 is patentable over the cited reference.

B. Claim 51

Since claim 51 was canceled in the February 21, 2003 Amendment, the rejection of such claim is moot.

C. Claim 56

Since claim 56 contains features which are analogous to the features recited in claim 46, Applicant submits that such claim is patentable for at least analogous reasons as presented above.

D. Claim 59

Applicant submits that claim 59 is patentable over the cited reference. For example, claim 59 recites that a piezo-electric device measures periodic peak values of a waveform by a predetermined number of periodic peak values from a predetermined point of time.

The Examiner maintains that Kurihara discloses such a feature. However, Applicant submits that the Examiner is misinterpreting and/or misapplying the cited reference. For example, Kurihara discloses that a wave detector 11 detects an electrical signal outputted from an amplifier 10. A comparator 12 compares the electrical signal with a reference signal to determine the existence of ink (para. [0004] and [0017]). The disclosure fails to teach that periodic peak values are measured by a predetermined number of periodic peak values from a predetermined point of time.

Accordingly, Applicant submits that claim 59 is patentable over the cited reference, and respectfully requests the Examiner to withdraw the rejection.

III. Rejection under 35 U.S.C. § 103(a) over Kurihara in view of U.S. Patent No. 6,347,853 to Kato (“Kato”), JP 11010909 to Nakano (“Nakano ‘909”) and U.S. Patent No. 6,012,794 to Nakano (“Nakano ‘794”).

Claim 13 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihara in view of Kato, Nakano ‘909 and Nakano ‘794. However, Applicant submits that claim 13 is patentable over the cited references. For example, claim 13 recites that an ink consumption

condition in an ink cartridge is redetected by a piezoelectric device after the consumption condition detection detects an absence of ink.

The Examiner maintains that Kato discloses such a method. However, Applicant submits that the Examiner is misinterpreting and/or misapplying the cited reference. For example, as disclosed in Kato, a first remaining ink volume detection operation is performed to determine the presence or absence of ink (col. 7, lines 4-8). After the first volume detection operation, a timer begins timing (col. 7, lines 8-12). When a certain time period has elapsed, a second remaining ink volume detection operation is performed to determine presence or absence of ink (col. 7, lines 11-14). The timer then begins timing again, and when the time has elapsed, a third remaining ink volume detection operation is performed to determine presence or absence of ink (col. 7, lines 24-27). A determination is then made as to whether any two of the three detection values obtained during the detection operations indicate that there is or is not any ink remaining (col. 7, lines 28-31).

The reference also discloses that just two out of the three operations disclosed above can be performed, and if the results of the two operations do not correspond to one another, a third detection operation can be performed (col. 8, lines 9-50).

As stated in the method of claim 13, the reconfirming of ink is only performed when absence of ink has been detected in the initial detection of consumption condition. Therefore, contrary to the teachings of Kato, ink detection is not performed twice, unless absence of ink is detected in the initial detection of consumption condition. Therefore, Applicant submits that Kato fails to teach or disclose the method as it is recited in claim 13.

Accordingly, since Nakano '909 and Nakano '794 fail to cure the deficient teachings of Kato and Kurihara, Applicant submits that claim 13 is patentable over the combination of the cited references.

IV. Rejection under 35 U.S.C. § 103(a) over Kurihara in view of Kato, Nakano '909 and U.S. Patent No. 4,337,470 to Furukawa ("Furukawa").

Claim 14 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihara in view of Kato, Nakano '909 and Furukawa. However, since claim 14 contains features that are similar to the features recited in claim 13, Applicant submits that such claim is patentable for at least similar reasons.

V. Rejection under 35 U.S.C. § 103(a) over Kurihara in view of Kato and Nakano '909.

Claims 15-19 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihara in view of Kato and Nakano '909.

A. Claim 15

Since claim 15 contains features that are similar to the features recited in claim 13, Applicant submits that such claim is patentable for at least similar reasons.

B. Claim 16

Since claim 16 contains features that are similar to the features recited in claim 13, Applicant submits that such claim is patentable for at least similar reasons.

C. Claims 17 and 18

Since claims 17 and 18 are dependent upon claim 16, Applicant submits that such claims are patentable at least by virtue of their dependency.

D. Claim 19

Since claim 19 contains features that are similar to the features recited in claim 13, Applicant submits that such claim is patentable for at least similar reasons.

VI. Rejection under 35 U.S.C. § 103(a) over Kurihara in view of Kato and Nakano '909, in further view of U.S. Patent No. 5,900,888 to Kurosawa ("Kurosawa")

Claim 20 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihara, Kato, Nakano '909 and Kurosawa. However, since claim 20 is dependent upon claim 19, and Nakano '909 and Kurosawa fail to cure the deficient teachings of Kurihara and Kato, Applicant submits that such claim is patentable at least by virtue of its dependency.

VII. Rejection under 35 U.S.C. § 103(a) over Kurihara in view of Kato and Nakano '909, in further view of U.S. Patent No. 6,438,500 Froger et al. ("Froger")

Claim 21 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihara in view of Kato and Nakano '909, as applied to claim 19 above, and further in view of Froger. However, since claim 21 is dependent upon claim 19, and Nakano '909 and Froger fail to cure

the deficient teachings of Kurihara and Kato, Applicant submits that such claim is patentable at least by virtue of its dependency.

VIII. Rejection under 35 U.S.C. § 102(b) over Kurihara in view of JP 07137291 to Hoshino (“Hoshino”).

Claims 47-48 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Kurihara in view of Hoshino. However, since claims 47-48 depend, either directly or indirectly, upon claim 46, and Hoshino fails to cure the deficient teachings of Kurihara, Applicant submits that such claims are patentable at least by virtue of their dependency.

IX. Rejection under 35 U.S.C. § 102(b) over Kurihara in view of U.S. Patent No. 5,506,611 to Ujita et al. (“Ujita”).

Claims 49-50, 55 and 60 have been rejection under 35 U.S.C. § 102(b) as being anticipated by Kurihara in view of Ujita.

A. Claims 49, 50 and 55

Since claims 49, 50 and 55 are dependent, either directly or indirectly, upon claim 46, and Ujita fails to cure the deficient teachings of Kurihara, Applicant submits that such claims are patentable at least by virtue of their dependency.

B. Claim 60

Since claim 60 is dependent upon claim 59 and Ujita fails to cure the deficient teachings of Kurihara, Applicant submits that such claim is patentable at least by virtue of its dependency.

X. Rejection under 35 U.S.C. § 103(a) over Kurihara in view of Kato

Claim 52 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihara in view of Kato. However, since claim 52 is dependent upon claim 46, and Kato fails to cure the deficient teachings of Kurihara, Applicant submits that such claim is patentable at least by virtue of its dependency.

XI. Rejection under 35 U.S.C. § 103(a) over Kurihara in view of Kato and further in view of Nakano '909

Claim 53 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihara in view of Kato, as applied to claim 52 and further in view of Nakano. However, since claim 53 is indirectly dependent upon claim 46, and Kato and Nakano '909 fail to cure the deficient teachings of Kurihara, Applicant submits that such claim is patentable at least by virtue of its dependency.

XII. Rejection under 35 U.S.C. § 103(a) over Kurihara in view of Kato and Nakano '909 and further in view of Furukawa.

Claims 54 and 62 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kurihara in view of Kato and Nakano '909, as applied to claim 53, and further in view of Furukawa.

A. Claim 54

Since claim 54 contains features that are similar to the features recited in claim 13, Applicant submits that such claim is patentable for at least similar reasons.

B. Claim 62

Since claim 62 is indirectly dependent upon claim 46, and Kato and Nakano '909 fail to cure the deficient teachings of Kurihara, Applicant submits that such claim is patentable at least by virtue of its dependency.

XIII. Newly added claims

Applicant has added claims 64-71 to provide more varied protection for the present invention.

XIV. Conclusion


In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

Amendment under 37 C.F.R. § 1.111
U.S. Application No. 10/031,408

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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